PATENT

IN THE UNITED STATES PATENT AND TRADEMARK OFFICE

Application No.:	09/740,584
Filing Date:	December 18, 2000
Applicant:	Jeffrey Morgan Alden et al.
Group Art Unit:	2815
Examiner:	Allan R. Wilson
Title:	AUTOMATIC RECONFIGURATION OF SYSTEM SUB-MODELS FOR INDEPENDENT ANALYSIS
Attorney Docket:	GP-301022

APPELLANT'S BRIEF

This is Appellant's Brief filed in accordance with 37 CFR §1.192 appealing the Examiner's Final Rejection mailed May 4, 2005. Appellant's Notice of Appeal, pursuant to 37 CFR §1.191, was filed on July 14, 2005. This Brief is being submitted in triplicate. PTO Form 2038 is included herewith for authorization to charge a credit card the amount of $500.00 for filing this Appeal Brief pursuant to 37 CFR §1.17(c).

Table of Contents

I. Real Party in Interest 1

II. Related Appeals and Interferences 1

III. Status of the Claims 1

IV. Status of Amendments 1

V. Summary of the Invention 1

VI. Issues 2

VII. Grouping of Claims 3

VIII. Argument 3

- A. Claims 1 – 19 include statutory subject matter 3
- B. Independent claims 1, 8 and 13 are not anticipated by Rappaport 5
  - 1. Anticipation 5
  - 2. Independent claims 1, 8 and 13 5
  - 3. Rappaport 6
  - 4. Discussion 7
- C. The dependent claims are not anticipated by Rappaport 11

IX. Conclusion 12

APPENDIX A – COPY OF CLAIMS INVOLVED IN THE APPEAL 13

Table of Authorities

37 CFR §1.191 i

37 CFR §1.17(c) i

35 USC §101 .... 1, 5, 12

35 USC §102(e) 1, 3, 10, 12

Pub. No. US2005/0043933 (Rappaport et al.) 1

MPEP 2106 3

MPEP 2106IIA 3

MPEP 2106B 2(b)(i) 4, 5

MPEP 2131 5

I. Real Party in Interest

The real party in interest for this appeal is General Motors Corporation of Detroit, Michigan, the assignee of the application.

II. Related Appeals and Interferences

There are no related appeals or interferences.

III. Status of the Claims

Claims 1-19 are pending in this application. All of the pending claims stand rejected under 35 USC §101 because the claimed invention is allegedly directed to non-statutory subject matter. Claims 1-19 also stand rejected under 35 USC §102(e) as being anticipated by U.S. Patent Application Publication 2005/0043933 by Rappaport et al. (hereinafter Rappaport).

IV. Status of Amendments

All amendments have been entered.

V. Summary of the Invention

Appellant's invention is a method (74) for analyzing a sub-model (70, 90) that is a portion of a full system model (20). The system model (20) is representative of a certain system, such as a system for maintenance planning in a plant. In this embodiment, the sub-models 70 and 90 are influence diagrams. An influence diagram is a graphical display that shows a system model or operation of a system as a series of data entities and calculation entities interconnected by arrows. One can observe changes to the system model by changing one or more of the data entities, and then watching how

other entities in the influence diagram respond. For example, the size of the entities may change to show how the various data entries change. Therefore, the influence diagram provides a tool for analyzing the system model, in this case, a portion of the system model, without actually running the system. Paragraph [0025] of the specification provides specific examples of how the influence diagram is beneficial.

Appellant has defined data entities and calculation entities in the specification, particularly in paragraph [0023] and throughout the prosecution of this application. Entities are visual objects that include one or more things that define the system. A data entity includes a predetermined data value or values. A calculation entity includes a formula that calculates an output based on input values, where the input values come from other entities, including data entities and/or other calculation entities. The relationship between the entities are shown by arrows.

In the claimed invention, the sub-model (70, 90) is defined as part of the full system model (20). Once the sub-model (79) is defined, those calculation entities (26) in the sub-model (70) that depend on entities in the full model (20) that are not in the sub-model (70) are converted to data entities (24). One or more of the entities in the sub-model (70) may be identified as output entities if they are calculation entities (26) that do not have an output to another entity. When the sub-model (70) is run, the formulas in the calculation entities are calculated, and the size of one or more of the data entities (24) in the sub-model (70) changes in response thereto. A person can visually look at the changes in the data entities (24) to determine the operation of that portion of the full system model (20). Thus, a portion of the full system model (20) can be run without having to run the full system model (20) or the system. Based on this information, a person can remedy potential problems or deficiencies in the system

before they occur when running the system. Any suitable computer code and language can be employed to perform the algorithm of the invention as discussed herein.

VI. Issues

Whether claims 1-19 should be rejected under 35 USC §101 as being directed to non-statutory subject matter, and whether claims 1-19 should be rejected under 35 USC §102(e) as being anticipated by Rappaport.

VII. Grouping of the Claims

Claims 1 and 13 stand or fall together; claims 2 and 14 stand or fall together; claims 3 and 15 stand or fall together; claims 4, 5, 9, 10, 16 and 17 stand or fall together; claims 6, 11 and 18 stand or fall together; claims 7, 12 and 19 stand or fall together; and claim 8 stands or falls alone.

VIII. Argument

A. Claims 1 – 19 include statutory subject matter

Appellant submits that claims 1 – 19 fully comply with §101. MPEP 2106 states that a claimed invention is in compliance with §101 if it produces a "useful, concrete and tangible result." It is the Examiner's position that claims 1-19 do not produce a useful, concrete and tangible result because the claim element "visually analyzing changes in the sub-model includes analyzing changes in the size of at least one data entity" does not disclose how this is useful or tangible, and it is not concrete (Advisory Action mailaed 7-8-05). The Examiner also states that claims 1-19 are directed to non-statutory subject matter because the claims are drawn to a process that does nothing more than manipulate an idea, and do not claim a practical application (Final Office

Action mailed 5-4-05). The Examiner also states that claims 1-19 do not produce a concrete, useful and tangible result because the method claims are broad enough to read on an algorithm or a series of mental steps (Office Action mailed 4-02-04).

MPEP 2106 II A states that the Examiner has "the burden to establish a *prima facie* case that the claimed invention as a whole is directed to solely an abstract idea or to manipulation of abstract ideas or does not produce a useful result. Only when the claim is devoid of any limitation to a practical application in the technological arts should it be rejected under 35 USC 101." Appellant respectfully submits that the Examiner has not met this burden because he has not specifically stated how all of the claims are devoid of any limitation to a practical application.

Appellant submits that the claimed invention does produce a useful, concrete and tangible result because it allows a person to visually analyze the operation of a system that the system model represents by observing changes in the model as data is manipulated. The claimed invention is useful because the operation of the system can be observed to identify problem areas without having to incur the expense of operating the system. The claimed invention is concrete because changes in the sub-model, particularly the size of data entities, are provided in a physical visual medium so that the operation of the system can be better understood. The claimed invention is tangible because things (entities) are specifically defined that have a specific purpose in the system model and identify a specific thing about the system. All of the things are defined by the user, and they all combine to provide the useful result of being able to analyze the system.

The claimed invention further has useful, concrete and tangible results because it allows the system model to be separated the system model into sub-models so that a person can analyze a portion of the operation of the system without having to analyze

the whole system model. Appellant further submits that the claimed invention is useful because it provides a manner in which calculation entities in the sub-model that depend on entities in the full-model that are not included in the sub-model are converted into temporary data entities. In this manner, the sub-model can operate separately from the full system model because no entity in the sub-model relies on an input from an entity outside of the sub-model after the conversion.

Moreover, the invention as claimed satisfies §101 because it is more than an abstract idea and requires "physical acts to be performed outside of the computer" MPEP 2106B 2(b)(i). Particularly, the system model provides a visual representation of the operation of the system as input data changes, and therefore the entities are represented in a visual medium. A person who wishes to study or examine the operation of the system model visually analyzes changes in the model in response to the calculations of the calculation entities.

B. Independent claims 1, 8 and 13 are not anticipated by Rappaport

1. Anticipation

MPEP 2131 states that "a claim is anticipated only if each and every element is set forth and the claim is found, either expressly or inherently described, in a single prior art reference." It is the Examiner's position that each and every element in <u>all</u> of claims 1-19 are found in Rappaport. For the reasons given below, Appellant submits that this position is improper.

2. Independent claims 1, 8 and 13

Both of the independent method claims 1 and 8 include the following method steps:

defining the sub-model as a collection of entities in a visual medium;

determining which of the entities in the sub-model are calculation entities and which are data entities;

converting the calculation entities in the sub-model that depend on entities in the full model that are not included in the sub-model into temporary data entities;

identifying the output entities in the sub-model, where the output entities are calculation entities that do not have an output to another entity; and

visually analyzing changes in the sub-model in response to performing the calculations for the calculation entities.

Independent apparatus claim 13 includes:

means for defining a sub-model as a collection of entities in a visual medium;

means for determining which of the entities in the sub-model are calculation entities and which are data entities;

means for converting the calculation entities in the sub-model that depend on entities in the full model that are not included in the sub-model into temporary data entities;

means for identifying output entities in the sub-model where the output entities are calculation entities that do not have an output to another entity; and

means for visually analyzing changes in the sub-model in response to performing the calculations of the calculation entities.

3. Rappaport

Rappaport discloses a process for designing wireless and wired communications system. Figure 1 shows a two-dimensional layout and figure 2 shows a three-dimensional perspective of a building floor plan. From these layouts, a designer

identifies and specifies the location and type of wireless communication system equipment as discussed in paragraph 77. Using a three-dimensional environmental model and a wireless communication system placed within the environment, the designer acquires performance data by running prediction models on the communication system, collecting RF measurement data from the actual site the environmental model represents or other methods (paragraph 78). Figure 3 shows a comparison of performance values where cylinders of varying height and color indicate differences between predicted and measured data (paragraph 81).

4. Discussion

The Examiner has directed Appellant's attention in the Final Office Action to paragraphs 73, 75, 79 and 81 of Rappaport to teach the several elements of Appellant's claimed invention. Those paragraphs of Rappaport are recreated below:

> [0073] Referring now to FIG. 1, there is shown a two-dimensional (2-D) simplified example of a layout of a building floor plan. The method uses 3-D computer aided design (CAD) renditions of a building, or a collection of buildings and/or surrounding terrain and foliage. However, for simplicity of illustration a 2-D figure is used. The various physical objects within the environment such as external walls, internal walls and floors are assigned appropriate physical, electrical, and aesthetic values. For example, outside walls may be given a 10 dB attenuation loss, signals passing through interior walls may be assigned 3 dB attenuation loss, and windows may show a 2 dB RF penetration loss. In addition to attenuation, the obstructions are assigned other properties including reflectivity and surface roughness.

> [0075] Estimated partition electrical properties loss values can be extracted from extensive propagation measurements already published, which are deduced from field experience, or the partition losses of a particular object can be measured directly and optimized instantly using the present invention combined with those methods described in the copending application Ser. No. 09/221,985, entitled "System for Creating a Computer Model and Measurement Database of a Wireless Communication Network" filed by T. S. Rappaport and R. R. Skidmore. Once the

appropriate physical and electrical parameters are specified, any desired number of hardware components of RF sources can be placed in the 3-D building database, and predicted RF performance values such as received signal strengths (RSSI), network throughput, packet latency, packet error rate, quality of service (QoS), bit or frame error rate, chip energy to interference ratio (Ec/Io), or carrier-to-interference (C/I) ratios can be obtained. Of course, other well known communication parameters for wired or wireless communications systems, known now or in the future, may be used for appropriate prediction values. The preferred method for generating a 3-D environmental database is disclosed in the co-pending application Ser. No. 09/318,841, filed on May 26, 1999. The resulting definition utilizes a specially formatted vector database comprising lines and polygons that represent physical objects within the environment. The arrangement of lines and polygons in the database corresponds to physical objects in the environment. For example, a line or other shape in the database could represent a wall, a door, a tree, a building wall, or some other physical object in the modeled environment.

[0079] In the present invention, the designer may run performance prediction calculations, measure actual performance characteristics within an environment, or gather performance data using some other method known now or in the future. The novelty of the current method and apparatus is for displaying the results of measurements, performance prediction results, comparisons of measurements to performance prediction results, comparisons of two or more predicted performance results, and comparisons of two or more measurements. The 3-D visualization method allows an engineer or technician to rapidly determine the meaning or importance of the displayed information.

[0081] The resulting comparison calculations may be visualized directly on the 3-D environment database. Using variations in object shape, color, and/or height, the calculations may be visualized as shapes such as cylinders, rectangular prisms, spheres, cubes, or other objects directly in the 3-D environment database to show performance comparisons. FIG. 3 depicts a comparison of performance values where cylinders of varying height and color are shown in 3-D to indicate differences between predicted and measured data.

Appellant respectfully submits that the three-dimensional computer-aided design rendition of a building or a collection of buildings shown in figures 1-3 is not a rendition of a sub-model of a full system model of the type claimed by Appellant. The rendition

shown in figures 1-3 may be considered a full system model. However, Rappaport does not appear to separate the rooms and such from the building for analysis as a separate sub-model.

The Examiner appears to suggest that the walls and other physical parameters in the CAD rendition of a building shown in figure 1 are data entities that are part of a sub-model, citing paragraph [0073]. Further, the Examiner appears to suggest that electrical sources of RF noise, attenuation and other characteristics of the internal walls can be considered calculation entities, citing paragraph [0075]. Appellant submits that these paragraphs of Rappaport do not specifically distinguish between one type of entity and another type of entity as Applicant has claimed. Rappaport does show walls and other parameters of a building, and assigns physical, electrical and aesthetic values to these physical objects within the CAD rendition. However, Appellant submits that Rappaport does not distinguish between one type of entity that includes values (data), and another type of entity that includes a formula (calculation) that uses the data from the data entities as input values. Appellant submits that in some sense the electrical attenuation values given to the walls in the rendition can be considered data, but Appellant further submits that Rappaport has not distinguished these values as one type of entity and the RF sources as another type of entity, particularly an entity that has a formula for calculations. Therefore, Appellant submits that Rappaport does not provide the teaching to anticipate defining data entities and calculation entities as set forth in Applicant' independent claims.

Further, Rappaport does not appear to teach converting calculation entities in the sub-model that depend on entities in the full model that are not included in the sub-model into temporary data entities. The Examiner states that, "Rappaport teaches that windows are assigned specific values such as 2dB penetration loss although that value

would necessarily change based on many factors" to satisfy this feature of Appellant's invention. Appellant submits that assigning the windows a specific dB loss does not properly teach this feature of Appellants invention that would satisfy §102 because assigning a window a small dB loss does not teach changing one thing to another thing, where the other thing is part of the group of other things.

Further, Appellant submits that the Examiner's position on page 3 of the Office Action that "entities such as received signal strength are output entities without output to another entity" (paragraph 75) teaches the claimed feature of identifying output entities as calculation entities that do not have an output to another entity is a mischaracterization of what is fairly taught and suggested by paragraph [0075] for §102 purposes.

Appellant further submits that the discussion in paragraph [0081] of looking at variations in the shape, color and height of cylinders, rectangles, prisms, spheres, cubes or other objects does not teach the feature of Applicant's invention of performing calculations by calculation entities, and analyzing changes in the size of at least one data entity. Particularly, figure 3 shows a comparison in performance values where cylinders of varying height and color indicate differences between predicted and measured data (paragraph 81). Appellant submits that viewing the differences in a shape to indicate differences between predicted and measured data is different than performing calculations and then looking at changes in the size of data entities based on the calculations.

Through the several responses to Office Actions, Appellant has described their invention as a technique for observing the operation of a portion of a full system model based on a particular system without having to run the system model or the system. The model includes data entities and calculation entities as defined above that define

the system. This provides an important tool to see how certain things affect a particular system without having to incur the costs of running the whole system. Appellant submits that the several steps set forth in the claims to perform this analysis are not fairly taught by Rappaport.

C. The dependent claims are not anticipated by Rappaport

Dependent claims 2 and 14 and independent claim 8 include deleting connecting arcs directed to the temporary data entities. The Examiner has not discussed this feature of Applicant's invention, and Appellant can find no teaching in Rappaport of this feature. Therefore, Appellant submits that Rappaport cannot anticipate these claims.

Dependent claims 3 and 15 and independent claim 8 include identifying isolated cycles in the sub-model. The Examiner has not discussed this feature of the claims, and Appellant can find no teaching in Rappaport of this feature. Therefore, Appellant submits that Rappaport cannot anticipate these claims.

Dependent claims 4, 5, 9, 10, 16 and 17 include selecting an entity in an isolated cycle as an output entity, and arbitrarily selecting the entity. The Examiner has not discussed these features of the claimed invention, and Appellant can find no teaching in Rappaport of this feature. Therefore, Appellant submits that Rappaport cannot anticipate these claims.

Dependent claims 6, 11 and 18 include assigning data to all data entities in the sub-model, including the temporary data entities. The Examiner has not discussed this feature of Appellant's invention, and Appellant can find no teaching in Rappaport of this feature. Therefore, Appellant submits that Rappaport cannot anticipate these claims.

Dependent claims 7, 12 and 19 include adding all global variables to the sub-model that were not included in the sub-model when it was part of the full model. The Examiner has not discussed this feature of Appellants invention, and Appellant can find

no teaching in Rappaport of this feature. Therefore, Appellant submits that these claims are also not anticipated by Rappaport.

IX. Conclusion

Appellant respectfully submits that claims 1-19 are not anticipated by Rappaport. Appellant also submits that claims 1-19 define statutory subject matter. It is therefore respectfully requested that the Examiner's Final Rejection under §101 and §102 be reversed, and that Appellant's claims be allowed.

Respectfully submitted,

By: John A. Miller
John A. Miller
Reg. No. 34985
Phone: (248) 364-4300

General Motors Corporation
300 Renaissance Center
P.O. Box 300
Detroit, MI 48265-3000
(313) 665-4708
Dated: 8/11/05

APPENDIX A

COPY OF CLAIMS INVOLVED IN THE APPEAL

1. A method of analyzing a sub-model of a full system model, said system model representing a system, said method comprising the steps of:

defining the sub-model as a collection of entities in a visual medium;

determining which of the entities in the sub-model are calculation entities and which are data entities;

converting the calculation entities in the sub-model that depend on entities in the full model that are not included in the sub-model into temporary data entities;

identifying output entities in the sub-model, where the output entities are calculation entities that do not have an output to another entity; and

visually analyzing changes in the sub-model in response to performing the calculations for the calculation entities, wherein visually analyzing changes in the sub-model includes analyzing changes in the size of at least one data entity.

2. The method according to claim 1 further comprising the step of deleting those entities that the temporary data entities depend on.

3. The method according to claim 1 further comprising the step of identifying isolated cycles in the sub-model.

4. The method according to claim 3 wherein the step of identifying isolated cycles includes selecting an entity in an isolated cycle as an output entity.

5. The method according to claim 4 wherein the step of selecting an entity in an isolated cycle as an output entity includes arbitrarily selecting an entity in the isolated cycle as an output entity.

6. The method according to claim 1 further comprising the step of assigning data to all data entities in the sub-model, sad step of assigning data including assigning data to the temporary data entities.

7. The method according to claim 1 further comprising the step of adding all global variables to the sub-model that were not included in the sub-model when it was part of the full model.

8. A method of analyzing a sub-model of a full system model, said system model representing a system, said method comprising the steps of:

defining the sub-model as a collection of entities in a visual medium;

determining which of the entities in the sub-model are calculation entities and which are data entities;

converting the calculation entities in the sub-model that depend on entities in the full model that are not included in the sub-model into temporary data entities;

deleting those entities that the temporary data entities depend on;

identifying output entities in the sub-model, where the output entities are calculation entities that do not have an output to another entity; and

visually analyzing changes in the sub-model in response to performing the calculations for the calculation entities.

9. The method according to claim 8 wherein the step of identifying isolated cycles includes selecting an entity in an isolated cycle as an output entity;

10. The method according to claim 8 wherein the step of selecting an entity in an isolated cycle as an output entity includes arbitrarily selecting an entity in the isolated cycle as an output entity.

11. The method according to claim 8 further comprising the step of assigning data to all data entities in the sub-model, said step of assigning data including assigning data to the temporary data entities.

12. The method according to claim 8 further comprising the step of adding all global variables to the sub-model that were not included in the sub-model when it was part of the full model.

13. A system for analyzing a sub-model separated from a full system model, said system model representing a system, said system comprising:

means for defining the sub-model as a collection of entities in a visual medium;

means for determining which of the entities in the sub-model are calculation entities and which are data entities;

means for converting the calculation entities in the sub-model that depend on entities in the full model that are not included in the sub-model into temporary data entities;

means for identifying output entities in the sub-model, where the output entities are calculation entities that do not have an output to another entity; and

means for visually analyzing changes in the sub-model in response to performing the calculations for the calculation entities.

14. The system according to claim 13 further comprising means for deleting those entities that the temporary data entities depend on.

15. The system according to claim 13 further comprising means for identifying isolated cycles in the sub-model.

16. The system according to claim 15 wherein the means for identifying includes means for selecting an entity in an isolated cycle as an output entity.

17. The system according to claim 16 wherein the means for selecting an entity includes arbitrarily selecting an entity in the isolated cycle.

18. The system according to claim 13 further comprising means for assigning data to all data entities in the sub-model and assigning data to the temporary entities.

19. The system according to claim 13 further comprising means for adding all global variables to the sub-model that were not included in the sub-model when it was part of the full model.

AF

PTO/SB/21 (05-03)
Approved for use through 04/30/2003. OMB 0651-0031
U.S. Patent and Trademark Office; U.S. DEPARTMENT OF COMMERCE
Under the Paperwork Reduction Act of 1995, no persons are required to respond to a collection of information unless it displays a valid OMB control number.

TRANSMITTAL FORM

(to be used for all correspondence after initial filing)

Application Number	09/740,584
Filing Date	12-18-00
First Named Inventor	Jeffrey Morgan Alden
Art Unit	2815
Examiner Name	Allan R. Wilson
Attorney Docket Number	GP-301022
Total Number of Pages in This Submission	

ENCLOSURES *(Check all that apply)*

- [ ] Fee Transmittal Form
  - [x] Fee Attached
- [ ] Amendment/Reply
  - [ ] After Final
  - [ ] Affidavits/declaration(s)
- [ ] Extension of Time Request
- [ ] Express Abandonment Request
- [ ] Information Disclosure Statement
- [ ] Certified Copy of Priority Document(s)
- [ ] Response to Missing Parts/ Incomplete Application
  - [ ] Response to Missing Parts under 37 CFR 1.52 or 1.53
- [ ] Drawing(s)
- [ ] Licensing-related Papers
- [ ] Petition
- [ ] Petition to Convert to a Provisional Application
- [ ] Power of Attorney, Revocation Change of Correspondence Address
- [ ] Terminal Disclaimer
- [ ] Request for Refund
- [ ] CD, Number of CD(s) ____________
- [ ] After Allowance communication to Group
- [ ] Appeal Communication to Board of Appeals and Interferences
- [x] Appeal Communication to Group **(Appeal Notice, Brief, Reply Brief)**
- [ ] Proprietary Information
- [ ] Status Letter
- [x] Other Enclosure(s) (please Identify below):

PTO Form2038 - Credit Card Payment Form - $500 sm.entity Appeal Brief fee & Return Receipt Postcard

Remarks

Applicant believes sufficient fees are enclosed for the attached filing, however, should additional fees be due in order to prevent the abandonment of this application, please consider this as authorization to charge Deposit Account No. 501612 (Warn, Hoffmann, Miller & LaLone, P.C.) for any such fees due. A duplicate copy of this document is enclosed for this purpose.

SIGNATURE OF APPLICANT, ATTORNEY, OR AGENT

Firm or Individual name	Warn, Hoffmann, Miller & LaLone, P.C. John A. Miller - Reg No. 34,985
Signature	John A Miller
Date	8-11-05

CERTIFICATE OF TRANSMISSION/MAILING

I hereby certify that this correspondence is being facsimile transmitted to the USPTO or deposited with the United States Postal Service with sufficient postage as first class mail in an envelope addressed to: Commissioner for Patents, P.O. Box 1450, Alexandria, VA 22313-1450 on the date shown below.

Typed or printed name	John A. Miller - Reg No. 34,985		
Signature	John A Miller	Date	8-11-05